

THE ATOM

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scientific laboratory
OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

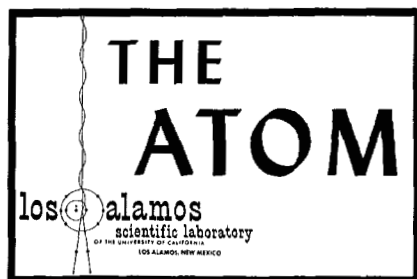
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ON THE COVER: The Los Alamos Canyon Bridge, shown in this rush-hour cover photograph by Bill Regan, has an interesting past. A story and previously unpublished photographs of its construction begin on page 3.

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OPPENHEIMER TO SPEAK HERE

LAB'S FIRST DIRECTOR
WILL DISCUSS "NIELS BOHR
AND ATOMIC WEAPONS"

Dr. J. Robert Oppenheimer, the Laboratory's first director and one of the world's best known scientists, will speak in Los Alamos May 18. He will discuss "Niels Bohr and Atomic Weapons."

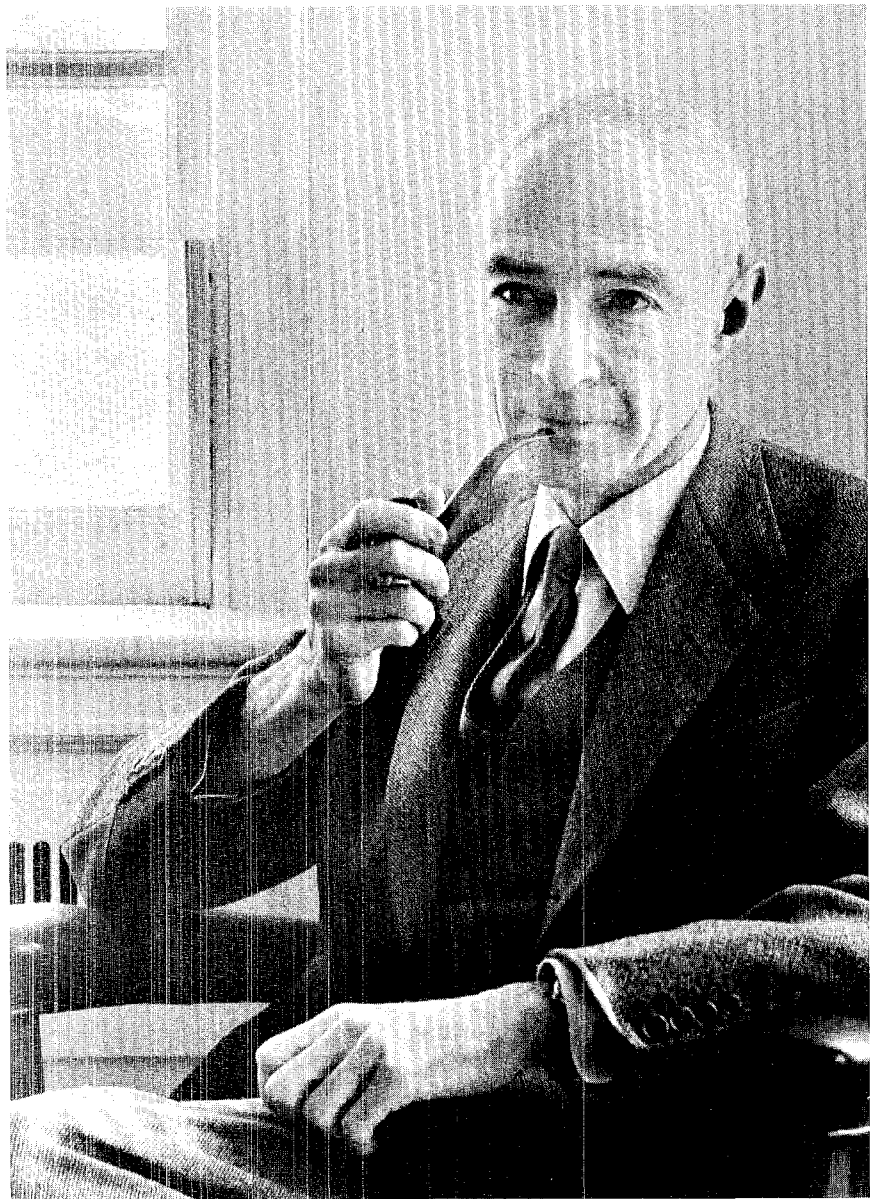
Oppenheimer's talk is being sponsored by the Laboratory and will be held at Civic Auditorium at 8:30 p.m., MDT. The public is invited and there will be no charge for admission.

Long familiar with Los Alamos, Oppenheimer recommended it as the site for the atomic bomb laboratory he helped establish and which he directed from early 1943 until late 1945.

Since 1947 he has been professor of physics and director of the Institute for Advanced Study at Princeton, New Jersey.

He was the 1963 winner of the Atomic Energy Commission's \$50,000 Enrico Fermi Award, the highest honor the AEC can bestow. The Commission's General Advisory Committee cited him for his "unique role in the development of physics in the United States, as a teacher, as an originator of several fundamental concepts and as the administrator under whose leadership the atomic bomb was successfully developed at Los Alamos Scientific Laboratory during World War II."

This will be Oppenheimer's first



DR. J. ROBERT OPPENHEIMER

public lecture in Los Alamos since he resigned as Director of the Laboratory. His talk will be one of LASL's continuing Special Evening Lecture series.

Oppenheimer is also scheduled to present a series of lectures at the

University of California's Berkeley campus during the last week of April and will speak at UCLA on May 12.

Mrs. Oppenheimer will accompany her husband to Los Alamos. They plan a two or three day visit.

Short Subjects

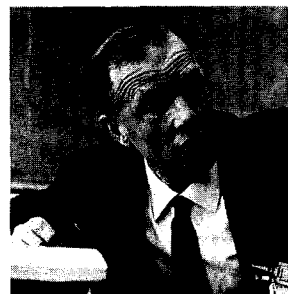
The Rio Grande Chapter of the Special Libraries Association will hold a public discussion meeting at 3 p.m., Friday, April 24 at La Fonda in Santa Fe. Topic of the meeting will be "Information and the User." A panel of five New Mexico scientists will take part, including from LASL, Don Rose, Ed Storms and Morris Milligan. All interested persons are invited to attend the meeting and discuss problems in using their special libraries as sources of scientific and technical information.

A three-day course at NRDS titled "Cryogenics for Nuclear Rocket Applications" was attended by about 100 engineers and scientists concerned with the NERVA program. Lecturers for the course were Frederick J. Edeskuty, Kenneth D. Williamson, Jr., Adam F. Schuch, Robert H. Sherman, Henry L. Laquer, Eugene C. Kerr and Donald H. Liebenberg, all of LASL, and Egon A. DeZubay of Westinghouse. The course was held last month.

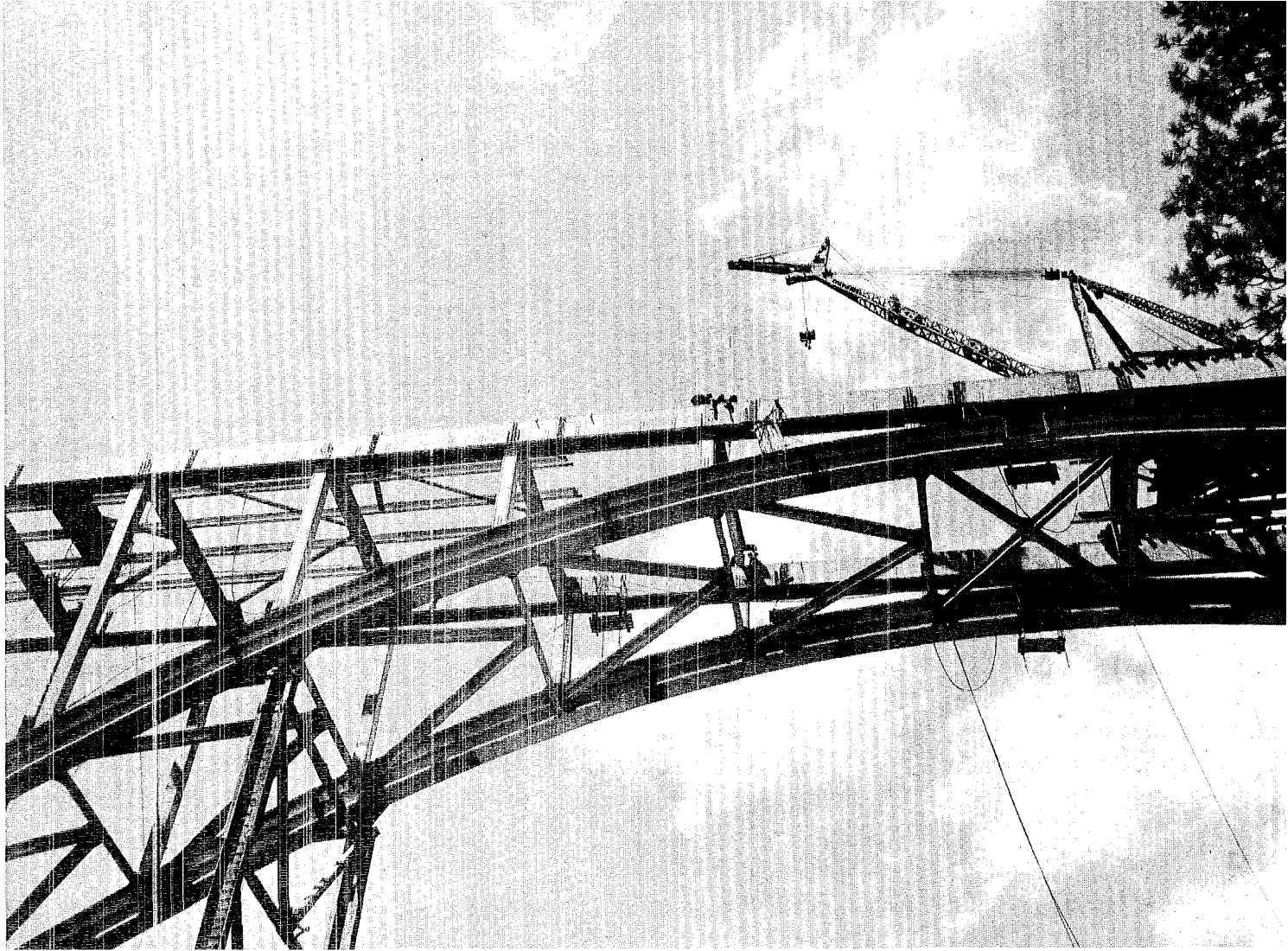
A tour of several Los Alamos technical facilities is among the special events scheduled during a three-day conference to be held April 22, 23, and 24 by the Associated Rocky Mountain Universities at the University of New Mexico. Technical sessions sponsored by ARMU under an AEC contract will be devoted to research in radiation effects and radiation biology. A panel discussion on University-AEC cooperation also is scheduled. Principal purpose of the conference is to acquaint university faculty in the Rocky Mountain region with the facilities and research activities of the AEC laboratories in Albuquerque and Los Alamos and to acquaint personnel of these laboratories with research efforts in the various Rocky Mountain universities.

The Los Alamos County Civil Defense organization has been designated by the County Commissioners as the official body responsible for all search and rescue work in the county. All agencies and organizations have been requested to cooperate. Anyone seeking assistance in finding a lost person, or wanting to volunteer assistance in searching for a lost person, is asked to get in touch with the County Civil Defense Director, Robert Y. Porton (phone 7-5456 or 7-4444) or Alan Hasty, County Sheriff and Coordinator of Search and Rescue Operations (phone 7-4541 or 2-5928). The AEC has authorized LASL, Zia, and all other agencies under its jurisdiction to provide services, equipment, material, and manpower for the purpose on the request of the Civil Defense Director.

Two former LASL staff members have been named 1964 winners of the Ernest O. Lawrence Memorial Awards. They are Drs. Marshall N. Rosenbluth, who was with T Division from 1950 to 1956, and Theos J. Thompson, a member of P Division from 1952 to 1955.



A prominent member of the wartime British mission in Los Alamos returned to the Hill last month for the first time in more than 18 years. Dr. Phillip B. Moon, professor of physics at England's Birmingham University, spent four days here and spoke at a Laboratory colloquium March 10. Dr. Moon worked in Los Alamos from March 1944 to December 1945.



Workmen perch 180 feet above Omega Road in this 1950 photograph showing the bridge over Los Alamos Canyon as construction was in progress. The bridge started out to be two lanes wide, was built for three lanes, and is now four lanes wide.

WHEN THE BRIDGE WAS BEING BUILT

The bridge over Los Alamos Canyon is taken for granted by the thousands who cross it every working day, and only a few old timers now remember what it was like before the bridge was built. The facts have been forgotten—that it was (and still is) the longest and highest steel arch bridge in New Mexico; that it started out as a two-lane bridge, was built for three lanes and now is four lanes.

The bridge rightfully should be named the Carroll Tyler Memorial Bridge, because it was Tyler, then manager of the AEC here, who single-handed fought the battle of the

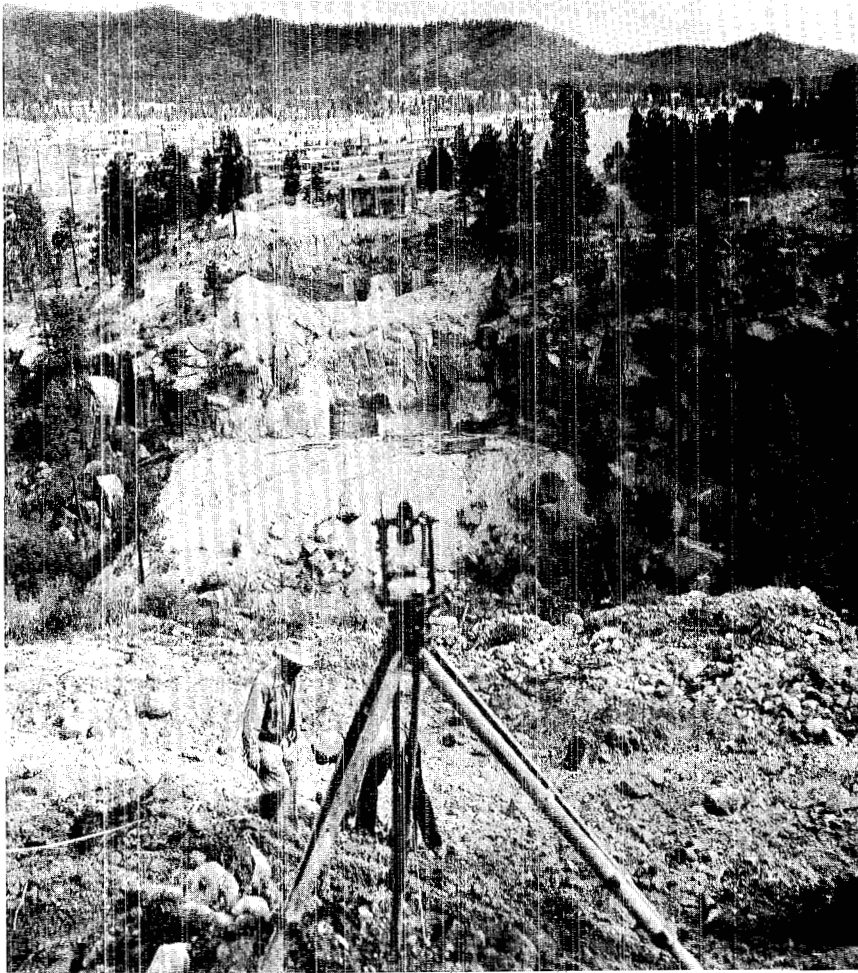
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BRIDGE...

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lanes in Washington. The Washingtons wanted a two-lane job; Tyler wanted four. He settled for three w-i-d-e ones.

That was away back in 1950. The original estimate was that it would cost \$1,105,745. But the winning bid, by the Vinson Construction Company of Phoenix, was for only \$704,781.94, and even with the customary additions, the final cost was only \$850,842. Vinson got the go-ahead on June 10, 1950, and the

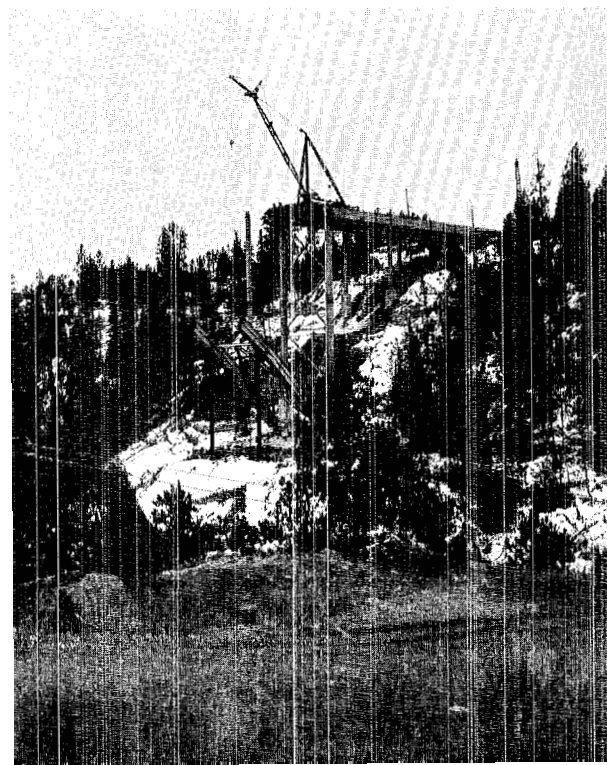


The bridge, in a very early stage of its construction, as viewed over a surveyor's tripod from the south side of the canyon.

RIGHT: The bridge was nearly complete, except for the roadway overhead, when this 13-year-old photograph was taken.



LEFT: A huge crane lifts a girder into place as the bridge begins to take shape.



AEC accepted the completed job a year and two months later, on August 20, 1951.

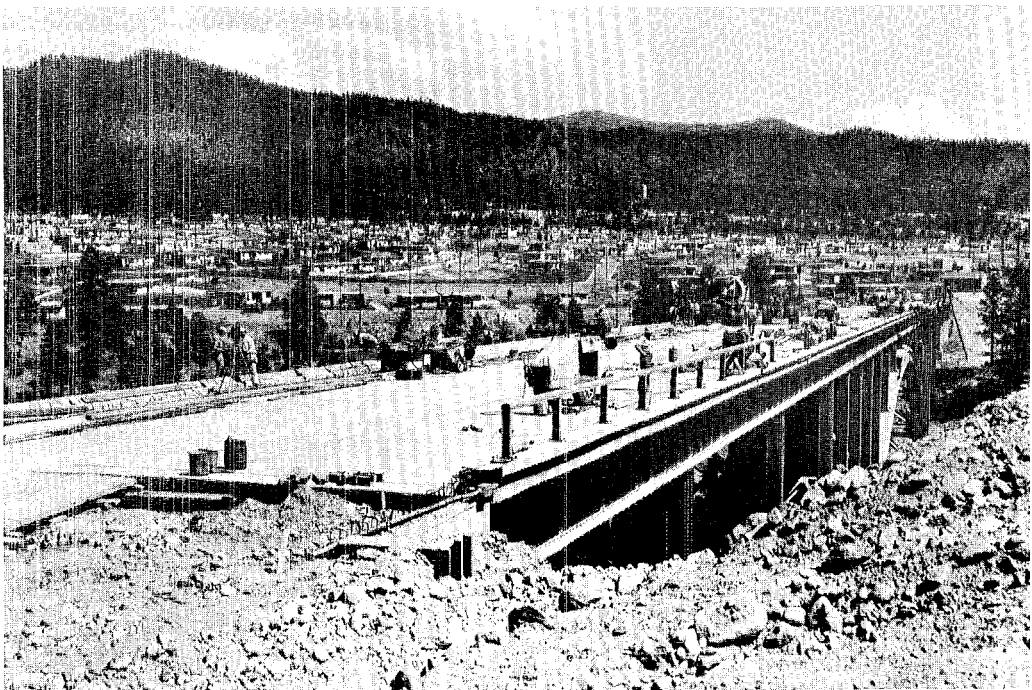
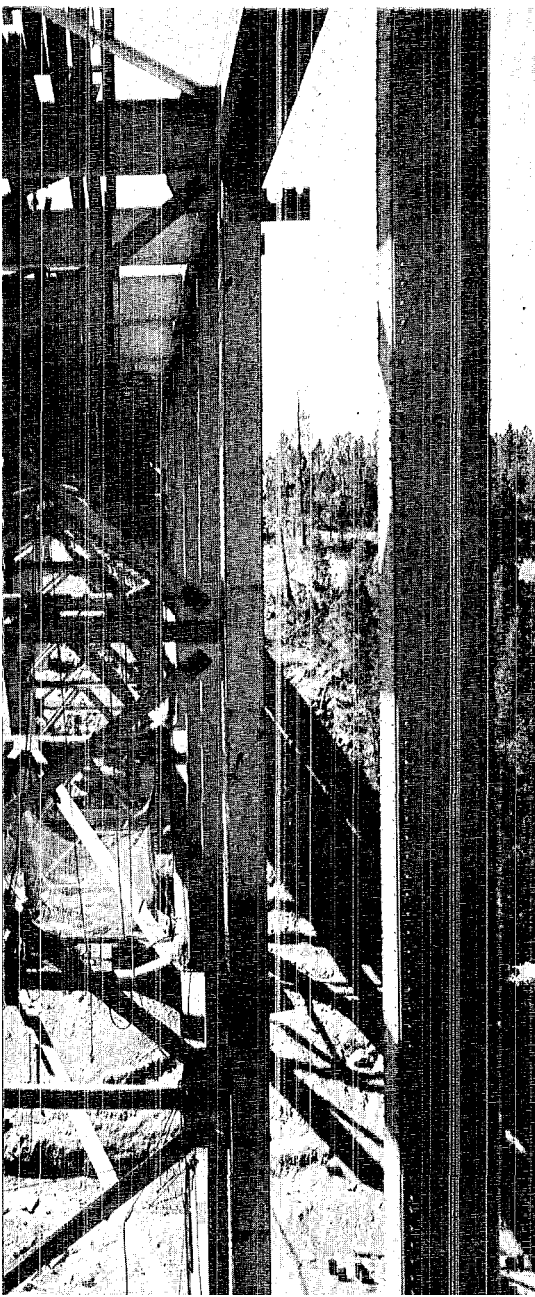
The bridge, officially, is 180 feet high above the Omega road. It is 47 feet, 2 inches wide, with a 40-foot roadway. Its total length is 819.6 feet. The clear span of the arch from hinge to hinge is 426.5 feet.

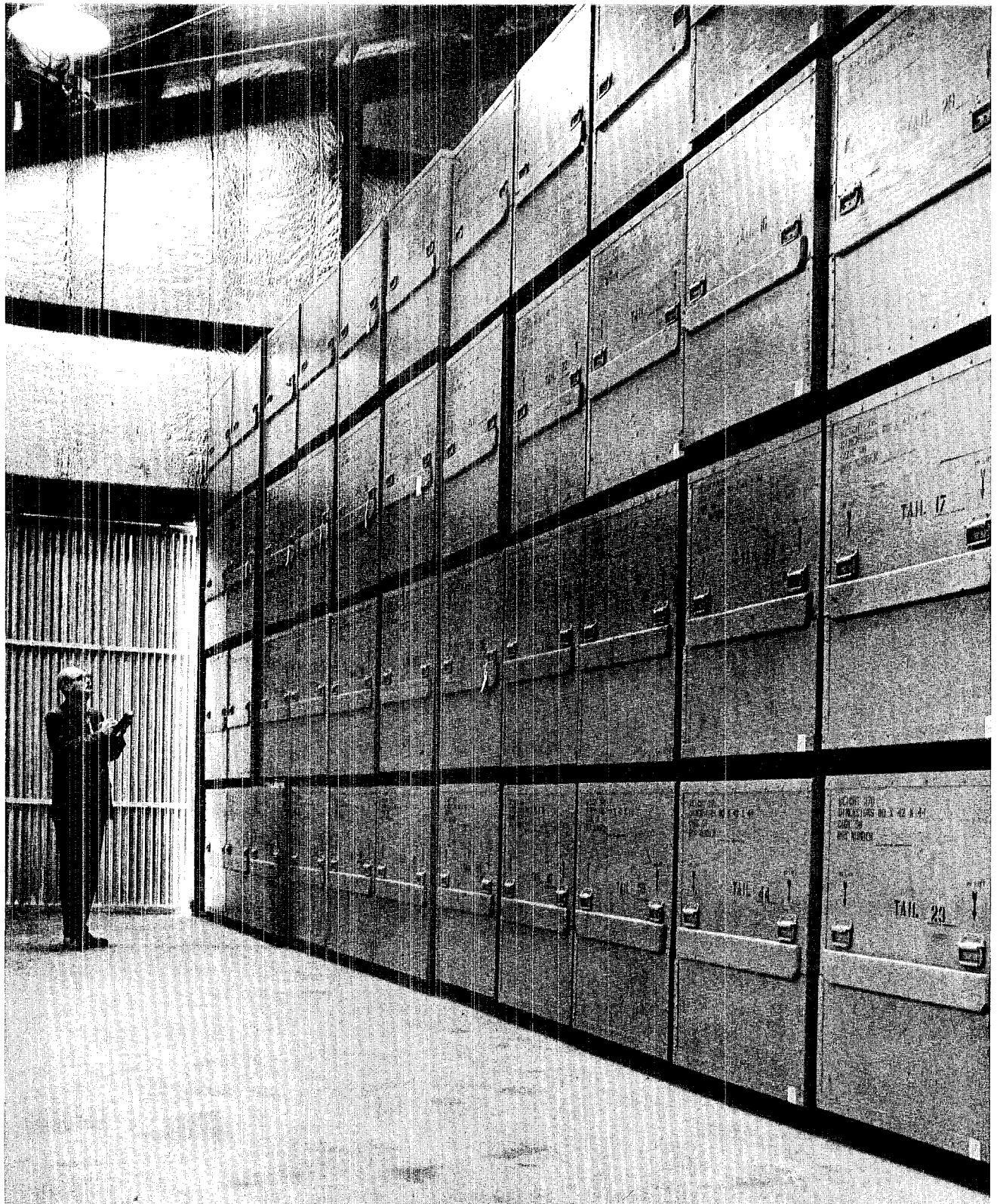
It is also an award-winner. It won an honorable mention from the American Institute of Steel Construction for steel bridges in 1962. Who designed it? The firm of Finney and Turnipseed of Topeka, Kansas. That's right!



Appearing to defy gravity, a section of the arch juts out over Omega Road.

With the roadway completed, workmen install guard rails atop New Mexico's longest and highest steel arch bridge. The total cost was \$850,842, considerably less than the original estimate.





LASL warehouses hold the darndest things! Here, Dwight Clayton, SP-2 group leader, tallies crates holding aircraft wing tanks used for air sampling after atmospheric nuclear burst tests.

Back in mid 1942 at Columbia University in New York City a young buyer for a secret war project placed an order for two compressors. The project was so new and so secret there wasn't even a delivery address—only "For Project Y."

Some months later the buyer himself transferred to Project Y, and Harry S. Allen arrived at Los Alamos in the spring of 1943. He is still acquiring things for the project; since 1948 he has been head of the Laboratory's Supply and Property Department.

More than half a million purchase orders for more than \$400,000,000 have been written for the Laboratory since its rather frantic start 21 years ago. Purchases now total about \$30,000,000 a year. Inventory records show equipment and supplies owned by the Laboratory have a value in excess of \$94,000,000.

This, remember, does not count buildings or utilities used by the Laboratory. They are owned by the Atomic Energy Commission. Early purchasing was accomplished secretly and from a number of places. Allen's work at Columbia was for the SAM Laboratory, a sort of cover operation for the new uranium project of the Army's Manhattan Engineer District; the University of California did most of its first Laboratory buying from Berkeley and then from Los Angeles. In New Mexico, orders went out mysteriously from 109 East Palace Avenue in Santa Fe and on occasion from the lobby of La Fonda.

When the organizational shake-down was over, supplying the project was directed from the Hill. Dana Mitchell, who was assistant director to Dr. J. Robert Oppenheimer, was boss; Allen, who had given up a job as a research chemist to do war work, was in charge of warehouse and stores. Field purchasing offices were located in Los Angeles, Chicago and New York. The main Los Alamos warehouse was in a temporary building along Trinity Drive near the power house.

THEY DO LASL'S SHOPPING

The Somewhat Frantic Story
Of The Laboratory's
Department of Supply and Property

BY EARL ZIMMERMAN

It's gone now. Chemicals were stored in an old stone stable clinging to the edge of Los Alamos Canyon in TA-1. It's gone now, too.

When Building P Prime was erected along the west bank of Ashley Pond in 1944, the Procurement Division gathered its burgeoning files and moved from scattered quarters to the second floor. Allen has had the same barracksy office there since November 1945, even the same desk. Two other procurement pioneers who are still on board are Robert J. Van Gemert, alternate department head, and Hugh Dubberly, who now heads SP's Procurement Group (SP-1). Both came to Los Alamos shortly after Allen, in mid 1943.

The Pajarito Plateau's isolation was ideal for nuclear research, but it was a continuing procedural pain for the people who had to buy the materials. In those days most of the nation's manufacturing was in the East. Thus the offices in New York and Chicago, although they operated on direction from Los Angeles. The New York office was closed in October 1945 but the Chicago buyers were active for another 10 years, until July 1955. Closing

the Eastern offices coincided with the tremendous industrial growth of Southern California and the Southwest generally. The Los Angeles Purchasing Office grew accordingly.

Buying for a research and development installation engaged in at least five different major sciences was not easy. It demanded, among other things, that buyers be well-acquainted with the products they sought and—especially during the war and in all weapons-connected purchases since—able to ferret out sources and obtain prompt delivery without revealing use. Purchase requests have not changed a great deal from the early days; the Laboratory still buys great amounts of explosives, electronics equipment and miscellaneous hardware.

At present somewhat more than half of all LASL purchase orders are filled by the Los Angeles office, an operation employing more than 50 persons and headed by another 21-year Laboratory veteran, Russell Johnson, group leader of SP-1A.

LASL buys lots of things, and then has to keep track and take care of them. There are 75,000

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S.P. HAS BOUGHT AT LEAST ONE OF NEARLY EVERYTHING THERE IS

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items on the numbered property list, and this doesn't include the thousands of expendables in the warehouses. SP-2 Group Leader Dwight Clayton, who has property management responsibility for the immense stocks, remarks: "We've got at least one of almost everything there is."

That "almost" has some unusual qualifications. The Laboratory is prohibited by contract, for instance, from purchasing automobiles, airplanes, motor scooters and alcohol. An alcohol purchase permit belonging to the Atomic Energy Commission is used for chemical laboratory needs. Although it doesn't own them, LASL operates hundreds of AEC cars and trucks. The Laboratory does own scores of trailers—61 "tube trailers" for transporting

pressurized gas, 80 monitoring trailers for air sampling at the Nevada Test Site, and dozens of vans equipped with instruments for use as field laboratories in Nevada and overseas. The exclusion clause does not apply to fork lifts, for warehouse use, nor to bicycles, and the Laboratory has also owned a junior-size crawler tractor complete with 'dozer blade.

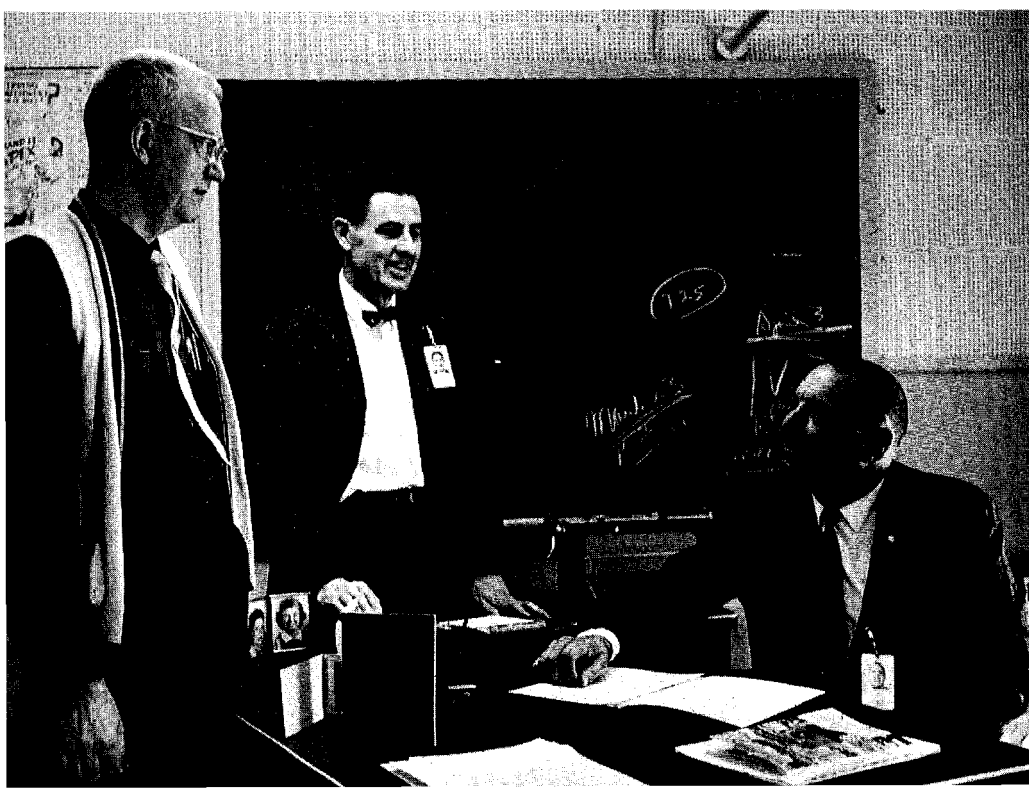
Purchase orders of late have averaged about \$1,000, an 80 per cent increase from the average 20 years ago. The biggest single order was written in the early 1950's, for more than \$3,000,000, to buy a fleet of refrigerated and mobile liquid hydrogen Dewars, double-walled Thermos-like tanks. Each weighed 45,000 pounds and had to be trucked to Los Alamos from an East Coast plant. One driver spent 24

hours in a Missouri jail after he was stopped on a highway overload charge. The Dewars were light compared with the cavities for the PHERMEX machine built last year and the tandem Van de Graaff accelerator tank delivered in February this year. But the heaviest load of all was Jumbo, Jr., an iron sausage weighing 250,000 pounds. It took a squad of trucks and tractors 2½ days to make the move from a railhead in Santa Fe to a concrete pad at Kappa Site.

But ask any SP staffer what causes the most trouble and the answer will be: "Animals." It used to be mice. Hundreds of "dead white mice" have been received at the Lamy rail freight platform, victims of poor handling by the shipper. Other animals perished because shippers failed to take precautions against unheated and unpressurized baggage compartments of high-flying aircraft. The biggest flap with animals, however, occurred this past winter when a shipment of monkeys raised havoc on the ground and in the skies all the way from Chicago. Poor importer crating was blamed for an "escape" at O'Hare Field in Chicago. A jet transport was delayed for more than an hour while the touring primate was recovered. Airborne, the crates were breached again and the pilot radioed to Albuquerque that "monkeys are loose in the baggage section." A force of deputies and Humane Society officers stood by with riot guns awaiting the plane's arrival. Excitement died when the monkeys, apparently tired from their transcontinental hi-jinks, moved docilely from the plane to LASL vans for the ride to Los Alamos. SP breathed easier; the monkeys weren't LASL's responsibility until they reached the ground in Albuquerque, caged.

Animals aren't the only cargo needing special care in transit. Some precision equipment has to be moved in temperature-controlled carriers; tolerances are so close that expansion and contraction because of temperature change

More than 60 years with LASL Supply and Property is represented in these veterans: From left, Hugh Dubberly, Robert Van Gemert and Harry S. Allen.



This cluster of gas tanks is in storage at SP chemicals warehouse.



can be damaging. Crystals used in scintillation detectors are extremely sensitive to temperature change and must be moved with great care. Liquid nitrogen used to be a problem. LASL is a big user—about 15,000 gallons a month—and before the development of portable Dewars in-transit losses almost equaled delivered amounts. For a number of years the Laboratory operated both liquid nitrogen and liquid hydrogen production plants as a part of CMF-9. Improvements in transportation reduced costs to the point where the plants were sold. Nitrogen can now be obtained from Midwest plants at a cost no greater than gasoline.

A LASL order for liquid hydrogen from a plant in Florida is remembered well at the Nevada Test Site. The truck driver was given instructions to check tank pressure every 10 miles. He misinterpreted his orders, though, to maintain the same tank pressure. So, each time he noticed the pressure rising he opened a release valve, triggering a further rise by the highly volatile liquid. By the time he arrived at NTS he had "bled" the entire load and delivered an empty truck.

SP's purchases range from high explosives (from Army Ordnance, but paid for) and gold (bids taken, because of fabrication requirements) to paper clips. Expendable items, like paper, chemicals and

film, are accountable but not assigned property numbers. Computers keep a running inventory so that shelves and bins in the several warehouses are always well-stocked. Goods such as instruments, office equipment, safes and tools, get a property number when received. Although active items number only about 75,000, Clayton's records show the Laboratory has numbered 190,000 pieces over the years; numbers are not reissued when material wears out and is retired or otherwise leaves service.

SP's Methusaleh is a signal generator bearing the almost pre-historic PN 1034 (numbering started with 1000). This venerable piece of electronics was purchased in May 1943 and at present is used by K-1.

There is a perhaps notable exception to the property number assignment procedure: Products of the weapons development pro-

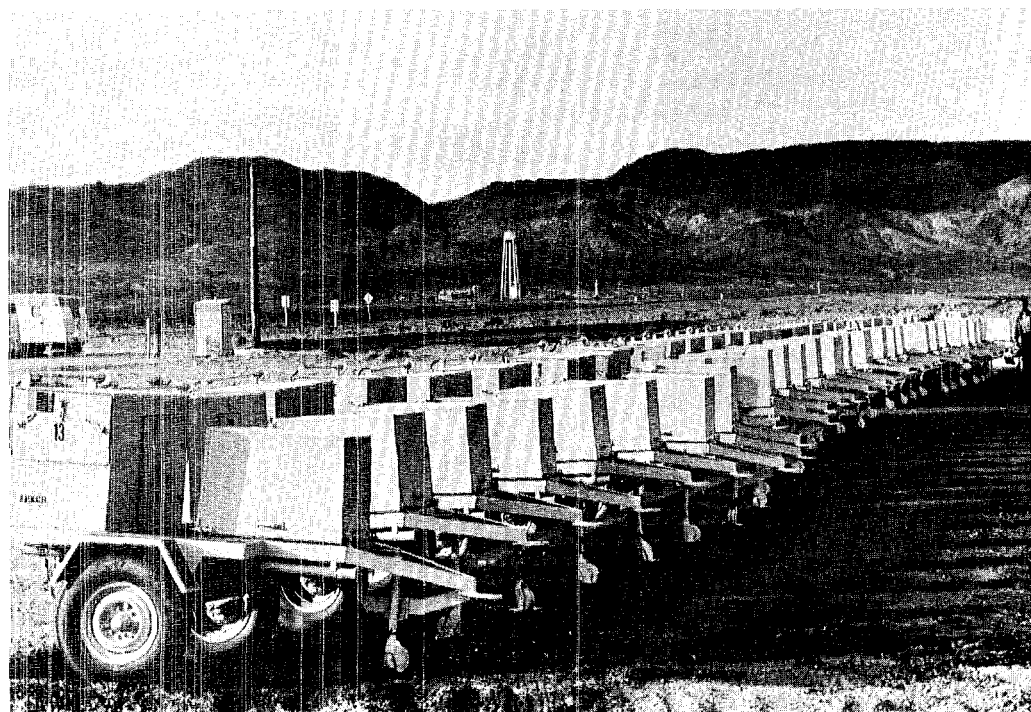
grams. Numbers are rarely assigned classified goods. The reason is that records would then have to be classified. Accountability for classified material is maintained through the various groups.

The activities of Supply and Property and its 250 employees point up an economic fact often overlooked by residents of Los Alamos and elsewhere in New Mexico:

The Los Alamos Scientific Laboratory and its supporting agencies are a mighty potent part of the development and well-being of the area.

Payrolls in Los Alamos—the Laboratory, AEC, Zia and local merchants—total more than—\$62,000,000 a year. More than 50 firms, most of them in Albuquerque and Santa Fe, who are suppliers to LASL, owe their growth and in some cases their existence to the Laboratory.

Radiation monitoring trailers are lined up before dispersal at the Nevada Test Site.



NEW OASIS HIGHWAY

BY PETER MYGATT

Many '49ers and subsequent emigrants fought their way across the American Southwest only to fall prey to Indians or die of thirst in the deserts of the Amargosa Valley and Death Valley.

The Amargosa, and its sometimes river, originates north of Beatty, Nevada. It flows generally south into California and then hooks north and deadends in Death Valley. Where the river does surface, particularly as it gets progressively nearer to Death Valley, the water becomes so alkaline as to be unpalatable, thus the name Amargosa, meaning very bitter.

But the Indians of the Shoshone nation had to have water, too, and they must have had a sweet water hole somewhere in the area to have been able to raid the wagon trains as regularly as they did. And indeed they had such water, some 60 million gallons a day located in a rather large oasis on the east side of the Amargosa Valley. But they weren't about to tell the white settlers the source of life in the desert.

The oasis is only about 25 miles from the Nuclear Rocket Development Station by direct route through Lathrop Wells. From Lathrop, you travel south on State Road 29 for a few miles and then turn left where a sign proclaims the *Swink Ranch*. You cannot miss the place. As you top a low escarpment, the desert becomes lush.

The trip is being made easier for workers at NRDS. Bids were

opened March 31 for construction of 11 miles of paved highway connecting NRDS with Highway 95 at Lathrop Wells. The 11 miles of road will connect with two miles of paved road being built by the Nye County highway department. An unimproved desert road has been in use between Lathrop and NRDS for some time. NRDS and NTS personnel living in Beatty and the Lathrop Wells vicinity have either been using the unimproved road or have been traveling approximately 40 miles to NRDS by way of Mercury.

In addition to providing access for personnel, the new paved road shortens the distance from NRDS to Los Angeles by some 100 miles.

The amount of water at the oasis, which is a working ranch owned by George Swink, almost staggers the imagination, but it is difficult to find a Nevada map or a reference that indicates or tells much about the Amargosa Valley, much less about the history and the oasis. One need only to look for high clumps or creosote bush, salt cedar, and cotton wood trees to find streams and the source of large springs.

These springs pour forth from fissures in metamorphic limestone. The crystal clear water of each spring, at about 80 degrees F, has carved deep, colorful pools. The pools appear shallow, but most of them are deeper than 12 feet. Perhaps one of the most intriguing

aspects is the presence of small "tropical" fish, some three or four species, that abound in these waters. And each spring and stream contains crayfish, bull frogs, fairy shrimp, and you are likely to flush nesting ducks from the bull rushes and water lilies.

There are a number of manmade lakes on Swink's place, much of the time replete with ducks and geese. Swink indicates he may open these large bodies of water at some future time to boaters, swimmers, and anglers.

To the east and nearer the mountains is Devil's Hole monument. In this water-filled cavern lives a species of *Cyprinodon*, a particular fish which is extinct except here.

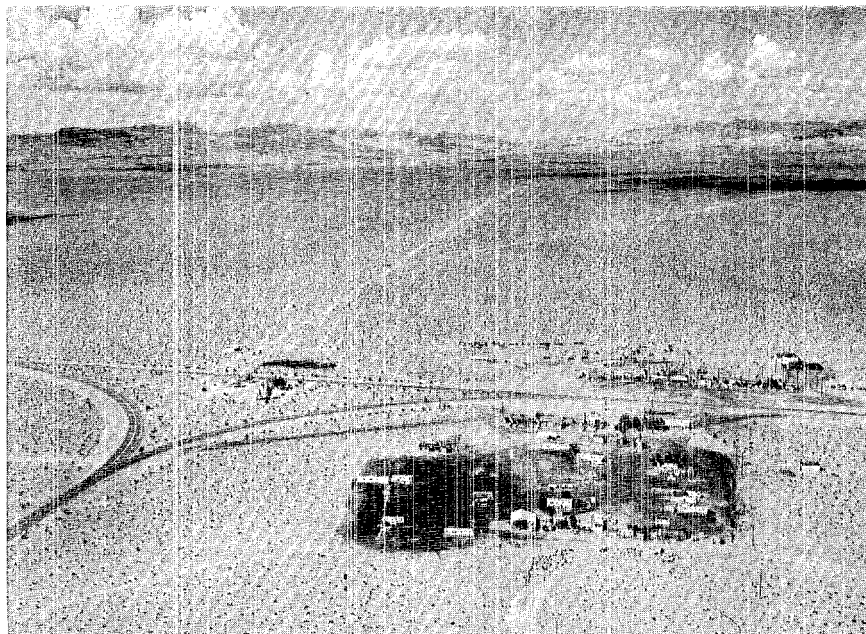
And the amateur archaeologist can have a field day in the area finding pot sherds, arrow heads, and other artifacts.

When white man finally did find this oasis in the bitter water valley, he promptly chased the Indians away, and farmers and ranchers moved in. The area has been and still is a source of bumper crops of alfalfa and vegetables. Old farm and ranch houses still dot the countryside and remnants of the old stage station are still visible.

Swink, who requests that you close gates as you drive through, raises a Brahma cattle crossbreed on the ranch; and a word of warning—stay clear of them, particularly if the cows have calves.



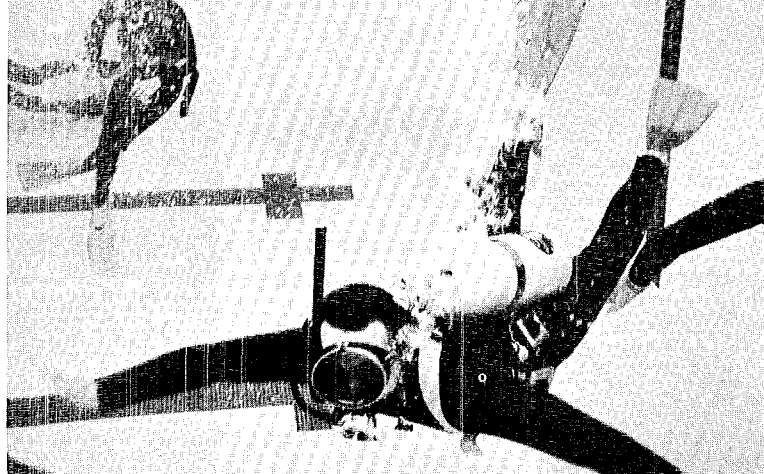
Peterson Lake at the Swink Ranch near Lathrop Wells, Nevada. The lake filled almost as fast as rancher George Swink could bulldoze a retaining dike. Wakes in the water are caused by ducks landing.



The new paved road between the Nuclear Rocket Development Station and Lathrop Wells will more or less follow the dirt road shown running towards the top right of this aerial photograph. Highway 95 is shown running horizontally across the photograph through Lathrop Wells. State Road 29 is at lower left.



With a forty-pound tank of compressed air on his back, this local scuba diver can remain underwater for periods up to an hour. Large flippers on his feet make it easier for him to swim underwater. His rubber suit offers protection from sharp objects and helps keep him warm.



The Underwater Sport

BY DAVID SUNDBERG

Photographs by Bill Jack Rodgers

If there's one thing Los Alamos is—it's organized. The Hill has nearly 200 clubs and organizations of nearly every sort imaginable—about one group for every 70 people.

There are Cooties and Elks, Lions, Lady Bugs, Toastmasters and Toastmistresses, RAMs, Rebekahs and Rainbow Girls.

For a town located atop a 7,000-foot-high plateau in landlocked and somewhat arid New Mexico, there are a surprising number of organizations which have to do with water. For example, Los Alamos has a Coast Guard Auxiliary, two Naval Reserve units, a white water racing club, and a fair number of swimming clubs.

It isn't altogether surprising, then, that a group of about two

dozen Los Alamos people have formed a scuba diving organization. It's the Water Sports Section of the Los Alamos Sportsmen's Club.

According to Harry Ballance, section chairman, the local scuba enthusiasts practice their underwater antics strictly as a sport. Anyone, Ballance says, who is a pretty good swimmer, in good physical condition, and who is willing to buy about \$200 worth of equipment, can enjoy scuba diving.

"Scuba," incidentally, is an abbreviation. You don't capitalize it but it stands for Self-Contained Underwater Breathing Apparatus.

With a 40-pound tank of compressed air on his back, the scuba diver can remain underwater for up to an hour at a time. He can swim about rather easily, aided by large flippers attached to his feet. A heavy rubber suit is standard equipment for keeping warm, even in near-freezing water.

None of the local scuba divers had ever practiced the sport before last summer when 17 of them arranged for a Santa Fe instructor to give them lessons at the golf course pool. Six members of that class served as assistant instructors in a second class which has just been completed at the high school indoor pool.

Several married couples are in the group. The wives, like Ballance's wife, Vilma, are as enthusiastic as their husbands about the sport.

The group plans a series of dives this summer in various lakes in New Mexico. "You have to choose the right lake at the right time," Ballance says. "When the water is muddy, you can't see far and it sort of puts a damper on the fun."

The underwater world of scuba divers may be the last stronghold of gallantry. Here a gentleman gives a lady a helping hand to the surface.



Facing page: Scuba divers, above and below the surface of the water, are shown in a single photograph. The unusual picture was made by a camera shooting through a window of a half-submerged water-tight box.



The cutleaf coneflower is a member of the sunflower family common to the Los Alamos area. While it is reputed to be poisonous to animals, its young stems have been used as food by Indians.

The W Color Sy

New Mexico's spring tide of wild flowers starts in the desert down around the Mexican border in February and reaches the level of Los Alamos in April, give or take a couple of weeks depending on the weather and the altitude. (Going up a thousand feet in altitude is about the same as going north 300 miles at sea level, and usually is good for an average drop of three degrees in temperature).

An open winter and early spring rains can produce a few venture-some blooms in late February hereabouts; late frosts and heavy snow can hold them back until May. In warm, sheltered canyons hardy varieties will appear well ahead of those that haunt the high meadows exposed to north winds.

But in most years, April is the beginning of the wildflower color



The Southwest is notable for its myriads of tiny spring flowers, many of them visible only at close range, leading to the name "belly flowers" because they are best seen from a prone position. ATOM Wildflower Photographer Bill Regan assumes the first ceremonial attitude in the process of photographing a flower on the rim of the Valle Grande.

Growing all over the Rocky Mountains and down into the plains, the mountain sunflower occurs in many varieties and sizes, but is still a many-petaled yellow flower with a brown center.

Wildflower Symphony

BY JOHN YOUNG

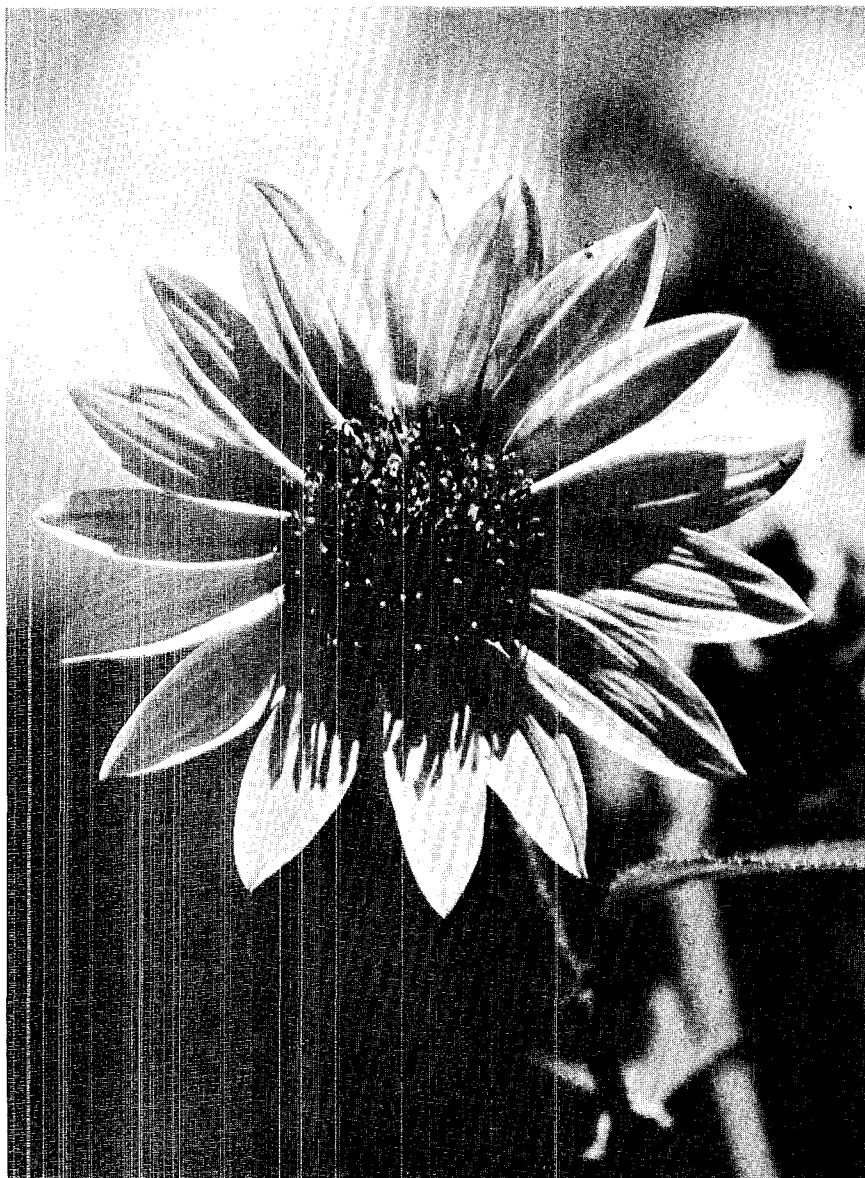
symphony which reaches its crescendo in July and August and subsides almost overnight with the first frost. The grande finale is the aspen show, when all the northern mountains put on their golden mantles to herald the approach of winter.

April also is the time for the yearly miracle of the willow tree, the time for the cottonwood flower catkins to appear ahead of the leaves, and for the box elder to produce its drooping clusters of greenish flowers.

New Mexico is one of the most abundantly favored of all the states in varieties of wildflowers and flowering trees and shrubs—some 3,600 species. A few of the more common and familiar kinds are described here. The reference shelves in Mesa Library have several volumes of interest on the subject.

At the lower elevations and in favored spots, blue, white and yellow flax and yellow monkey flowers, western wallflowers and wild candytuft are among the first to appear, easily identified from their similarity to domestic species. Higher up, the strange little crocus-like Pasque lily sometimes will push its tapered lavender petals through the pine needles almost before the snow is gone.

The large and showy thistle pop-



py, with its white flowers two to five inches across, blooms in April in the hills around Tesuque, while behind Santa Fe little pink phlox, yellow actinia or Perky Sue, the slender blue gilia and low-growing sand verbena will compete for attention. Mormon tea, a primitive leafless plant related to the pines, produces tiny cone-shaped flowers at this time. A tell-tale sign is the cloud of insects attracted by the flowers.

The narrow-leafed variety of red Indian paintbrush often appears in April, in high meadows among the pines, or along the roadsides. (The

leaves are red, not the flower. Its tiny greenish flower is hidden.) The plant is widely used by Indians for coloring and for medicine. A larger, scarlet variety with wider leaves blooms in June.

The sulphurflower also appears in April, easily identified by its umbrellas of bright yellow flowers, its flat leaves smooth and green on top, white and fuzzy beneath. Its Latin name, *Eriogonum*, meaning woolly knees, refers to the wooly joints of its stems.

The common Canada violet, white with purple tinges, shows up

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Wildflowers . . .

continued from preceding page

in April in Frijoles Canyon and other sheltered regions around 6,000 feet, spreading into the high country as spring advances. Some individual flowers may be all white.

Most common of local wildflowers, perhaps, is the cranesbill, or Richardson geranium, named for the crane-like beak on its seed capsule. This slender, white flower, sometimes with purple tinges, grows everywhere, almost anytime. The small yellow (or red and yellow) columbine appears in April, but its larger and showier cousin, the big blue Colorado columbine, usually waits until June, throughout the pine belt. The little blue Palmer's lupine is another very

common spring flower in these regions. It is closely related to the Texas bluebonnet.

The common branching daisy, also known as spreading fleabane, is the one you also see at lower elevations perhaps as early as March. It is bluish with a yellow center. (Like all daisies, its name is a corruption of "day's eye," from the resemblance of the flower to the sun and its rays.) This flower is easily confused with the two varieties of wild asters which, however, have fewer and wider rays, or petals, and which bloom in August, persisting until winter.

An occasional broad-leaved yucca will put up its shining white spike in April, and down along the Rio the ubiquitous Apache plume is likely to bust out in blossom any old time. The somewhat similar cliff rose, or quinine bush, is another earlier blossoming shrub, as is the related Antelopebush, or bitterbush.

The mountain mahogany, favorite browse of deer, blooms early in the spring, but its dull white or yellowish flowers are too inconspicuous to be noticed. Squawbush or skunkbush, one of the most common of shrubs in the piñon-juniper belt, may show up with dense yellow clusters of flowers in April in the lowlands. It resembles and is related to poison oak, but is harmless. Its sticky orange-red berry is used for a lemonade-like drink by

Indians, and its twigs are used in basketry.

Poison oak itself, fortunately rather scarce around Los Alamos, shows tiny white flowers among its glossy tri-foil leaves in April or May. All parts of the plant are toxic to people, but birds and animals eat them with impunity. The purple berries are a staple diet item for most birds.

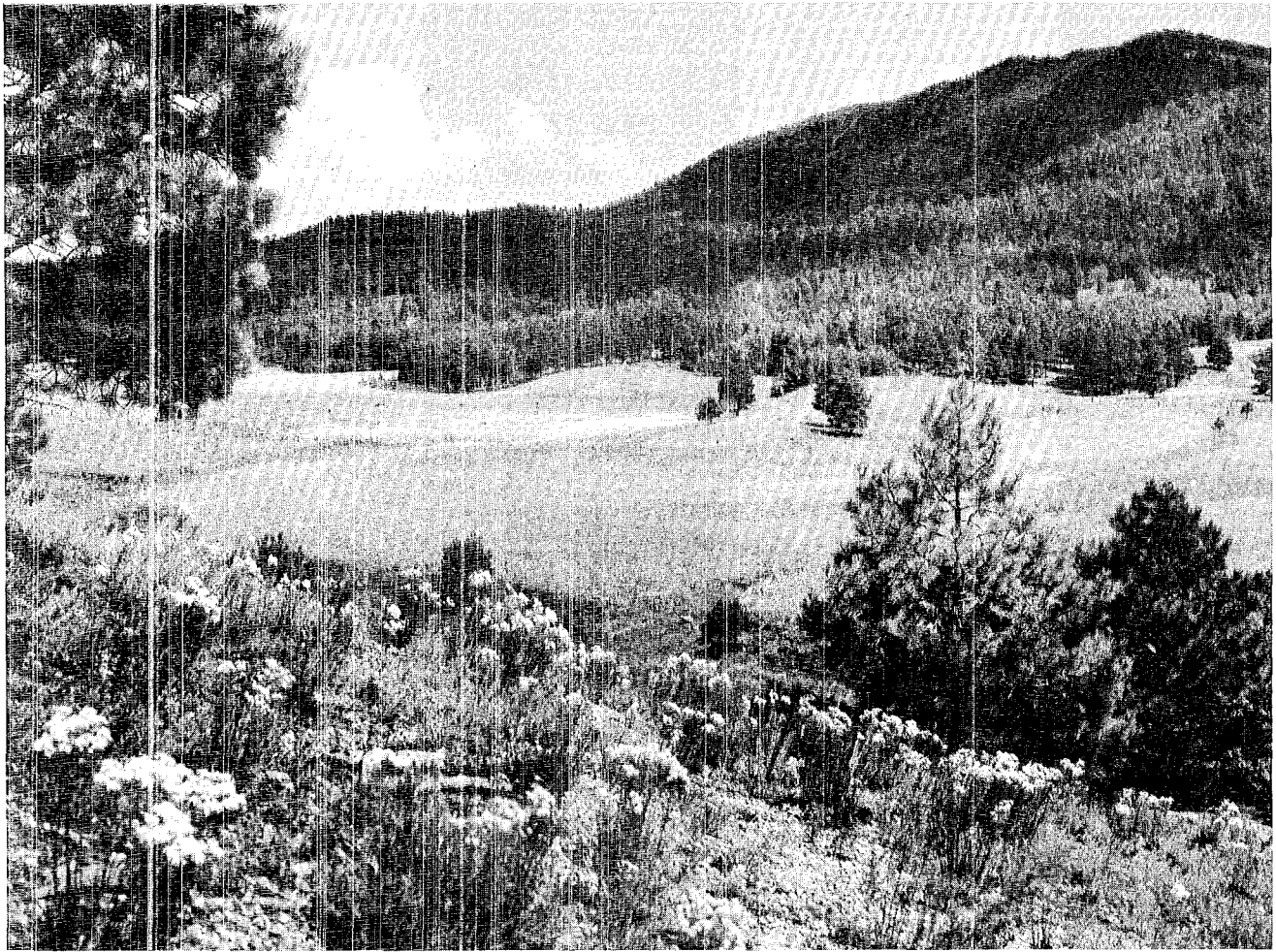
The common chokecherry produces its white flowers in April. This one people can eat—its fruit makes fine jam or jelly, or a purple-red dye. It is in the same genus as domestic prunes, peaches, plums, apricots, cherries and almonds. This tall shrub, sacred to the Navajos, may grow to 25 feet in its favorite habitat, the pine forests.

Buckbrush, or ceanothus, or wild lilac, is another April starter. Deer like it; Navajos make a tranquilizing medicine from it.

The orange gooseberry, with reddish flowers in April, produces prickly berries, purple when ripe, but it is being eradicated as it harbors the pine blister rust at one stage. The related gooseberry currant, with bright red edible berries, blooms in June. Its fruit is much sought by birds. Still another currant, the yellow-flowered golden or buffalo currant, as showy as forsythia in moist canyons, may be found blooming in April at the 5,000-foot level. It is spineless; its fruit is edible. The pointleaf manzanita, sometimes called bearberry, blooms in March or April. At the altitude of Los Alamos, the more common manzanita is the prostrate spreading kinnikinnick (*arctostaphylos uva-ursi*), whose small red berries resemble the little apple that provides its Spanish name. Its pinkish, waxy, bell-like flowers arrive in May or June, above 8,000 feet. Its leaves stay shiny green the year around.

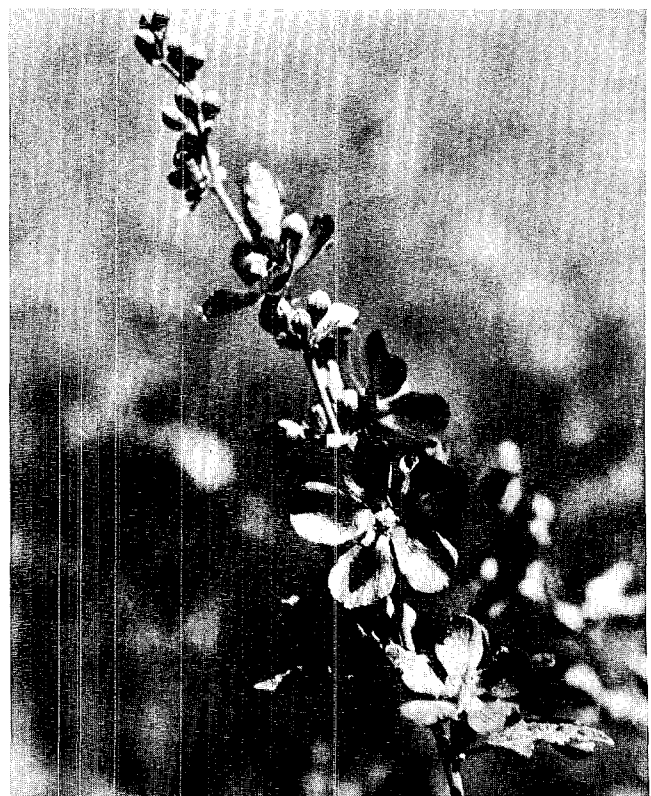
Mariposa lilies, or Sego lilies, ranging from pure white to yellow to deep magenta, are common to the southwest, from the desert to the spruce belt. Hopi, Navajo and early Mormon settlers used the bulbs for food. This is the state flower of Utah.





White yarrow flowers fill the foreground of this summer scene in the Jemez mountains. A member of the sunflower, yarrow is cultivated as a garden plant in white, yellow and red varieties. Southwestern Indians believe it has medicinal powers.

The common mallow, properly known as the New Mexico checkermallow, occurs in wet meadows and along roadsides in the pine belt. Its color, usually orange, may range from pink to mauve. It strongly resembles the cultivated hollyhock which belongs to the same family but is much larger. A European cousin is used in making marshmallow candy.





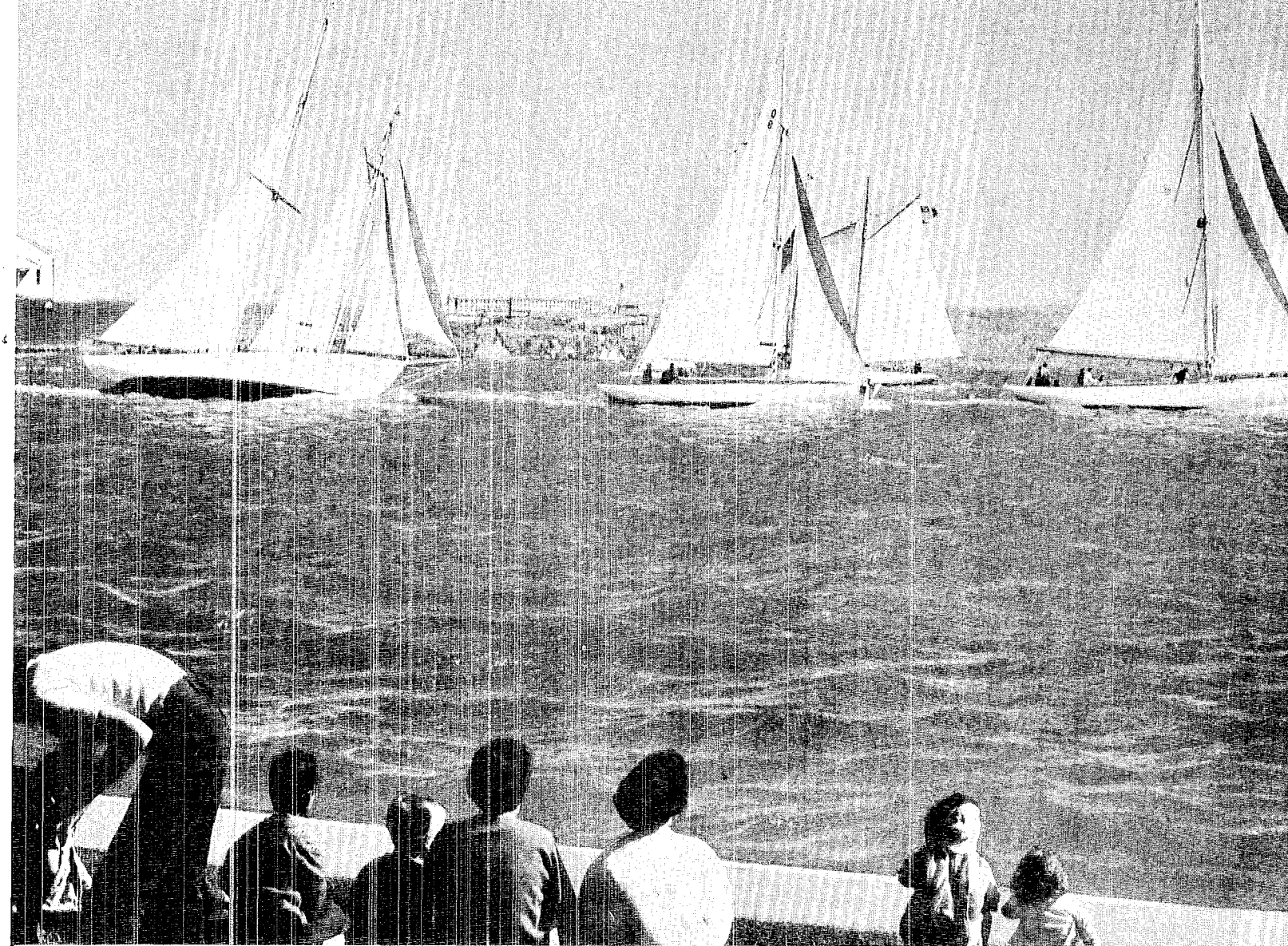
THE ASHLEY POND REGATTA

Eight thousand enthusiastic sailing fans turned out for the First Annual Yachtom Regatta on Ashley Pond. Virtually the entire community attended the well-publicized day-after-payday event. It attracted nationwide interest from amateur sailors as well as scientists intrigued by the proximity of a major sporting event to the famous Los Alamos Scientific Laboratory.

Correspondents from two major wire services, *Yachting Magazine*, *Sports Illustrated*, *Sea and Ski* and other well-known publications jammed the press boat which was moored at the finish line near the Mountain States Telephone Company building. The race committee patrolled the course aboard the 28-

foot steam launch, *Pride of Cochiti*, loaned for the occasion by the Ojo Caliente Steam Racing Association.

Sailboats of ten classes, ranging from tiny eight-foot El Toros to the big deep water Oso Negro schooners, maneuvered behind the starting line waiting for the 11:30 a.m. signal. Official Starter John Marshall got things rolling with a double plasma gun blast. The larger class boats crossed the starting line first, followed at five-minute intervals by the slower classes. Starting order was determined by LASL's T Division, which ran the complicated problem on the MANIAC computer. Improper weighting of the thin mountain air factor contributed to the chaotic scene at the



first mark when the Thistle fleet, which started after the Blue Jays, sailed through the slower class.

Highlight of the day's racing was the hour-long boat-to-boat clash between Darragh Nagle in Pion II and Dick Taschek in Vela II. Both skippers picked the same line for Ice House Cove and matched tack for tack. Pion II jibed around the Sundt Point Mark a quarter length ahead, but lost the advantage on a close reach along the Trinity White Sand Beach. Taschek had his crew far out on the hiking trapeze and kept his boat heeled to the limit to round the second mark one half length ahead. The downwind run for the finish line saw both boats running free with spinnakers out. A

change of wind direction plus an unexpected sharp gust near the Gamma Building shoreline caught Taschek's crew napping and snapped the mast before they could let the sheets fly. Vela II. lost way while Pion II, bow wave boiling over the splash rail, sailed across the finish line with the traditional broom lashed to the mast.

Red protest flags broke out all over the lake late in the afternoon when the two Johns, Woodward and Cole, smashed their sailing canoes into the third mark interfering with the Snipe fleet coming about. Henry Heyman's protest committee, after a heated discussion, disqualified the two canoes.

Another exciting moment in the

Pajarito Plateau sailing classic was a triple capsizing in full view of the crowded P Prime bleachers. The Bird boats arrived en masse with dire results for Kiwi, Plover Boy and Mountain Canary, skippered respectively by Keith Boyer, Charles Fenstermacher, and Avery Bond. Explorer Post 20 Scouts came to the rescue in their pickup raft and fished the three soggy sailors from the icy water.

ATOM Magazine's first regatta proved to be such a social and sailing success that it will continue to sponsor the April 1 Jemez Mountain event. With a year to plan the next event, Commodore Norris Bradbury, regatta director, hopes to attract at least twice as many contestants.

THE ODYSSEY OF "OLD HOMEY"



BY BOB BRASHEAR

Freedom and a new home in Garcia Canyon are being offered to Old Homey, a five-point buck deer here being released by a conservation officer. Whether Homey will take it or not remains to be seen. The 150-pound buck was trapped and taken to the Sangre de Cristo Mountains last year but turned up in the same trap in the same LASL technical area this year.

—AEC Photograph

There's no place like home. One buck deer who hangs his rack in the Tech Area hills of Los Alamos Scientific Laboratory proved the point by completing a year-long odyssey to get back to his old sod.

Old Homey—for want of a better name—was caught January 8, 1964 in a trap set out by Homer Pickens, area conservation officer for the AEC, as part of his deer study program. When Pickens and his crew approached the rope enclosure to do the necessary tagging, they noticed a tag already in the ear of the 150-pound five-pointer. A check of the records revealed Old Homey, despite a pretty belligerent attitude in the trap, was just an old softy when it came to a yen for grazing in his own backyard.

The weather-worn tag in the buck's ear showed that he had been caught in the same trap on January 3, 1963. Then, to help out in the

program for improving herds in other sections of the state, he had been shipped to an area called Borrego Mesa, east of Cordova. Cordova is a hamlet in the Sangre de Cristo Mountains.

During the ensuing year the buck made his way back, not just to the Jemez Mountains and Pajarito Plateau (home of Los Alamos), but to the exact spot where he'd been captured a year before.

"His trip was amazing," Pickens said. "He was 31 airline miles from home across the Rio Grande Valley. This means he crossed farms, back roads, open country, the main highway running between the two mountain ranges, the Rio Grande River, and the maze of canyons at the end of Pajarito Plateau, just to get back home." Pickens said deer usually do not range far from their grazing "yards," and seldom demonstrate any kind of homing in-

stinct. This makes Old Homey very unusual.

Pickens has been running a conservation study on deer in the Los Alamos area since 1960. His traps don't injure the animals, but do allow officers to get near enough to them for tagging. Usually the animals are then carted off to other areas where herds are being strengthened. The information gained on the trapped animals is used to keep track of herd size, grazing habits, reproduction and survival.

Well, Homey was given a new tag, this one sporting a 12-inch blue vinyl plastic ribbon, and hauled off to Garcia Canyon north of Los Alamos. Pickens expects him back next year, though. "After all there aren't as many humans, cars, highways and rivers to get by, and besides, it's only about nine miles and not 31," he said.

FIREBALL PHOTOS BY LASER LIGHT

How would you go about taking a picture of what is happening inside the sun—or a hydrogen bomb?

If you tried to do this directly, all the film would show would be the bright, white blob of a fireball with a temperature of millions of degrees, a thousand times hotter than the surface of the sun.

In their work on Project Sherwood—the effort to produce a controlled thermonuclear reaction—LASL scientists want to know the structure of the fireball, what it looks like inside.

They are tackling the problem by using a light brighter than the sun itself, the incredibly intense beam produced by a pulsed ruby laser. When this beam is pointed into a device called an interferometer, the light is split into two paths. The interferometer, consisting of four mirrors placed at the corners of a parallelogram, arranges the two light paths so their lengths are different by precisely one half wave length. The arrangement gives a shadow pattern of parallel lines (top photograph) called a fringe pattern.

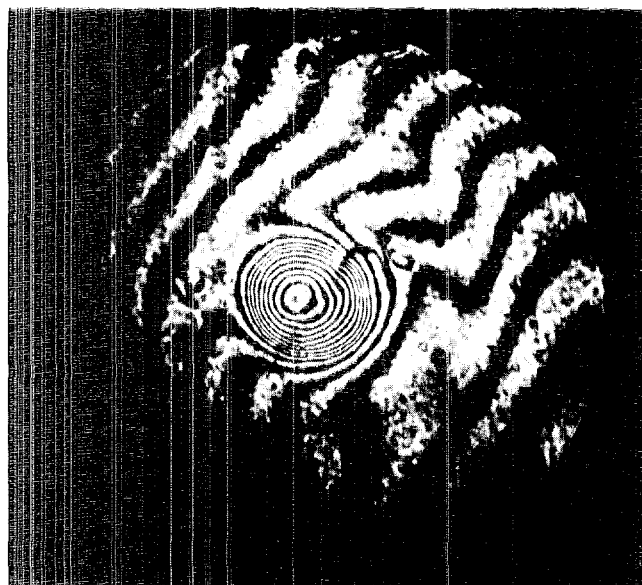
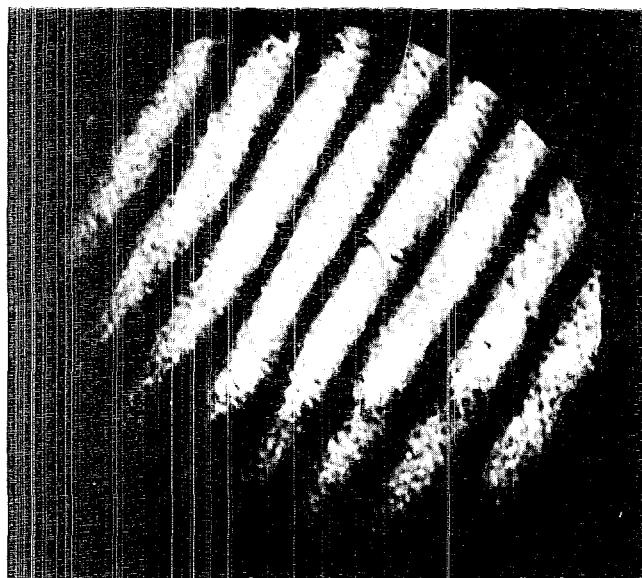
In applying this plan to their Sherwood work, using their Scylla IV thermonuclear device, the LASL group injects a little deuterium gas (heavy hydrogen) into a vacuum bottle about one meter long and 8.7 centimeters in diameter. An extremely fast and intense magnetic field is applied around the bottle,

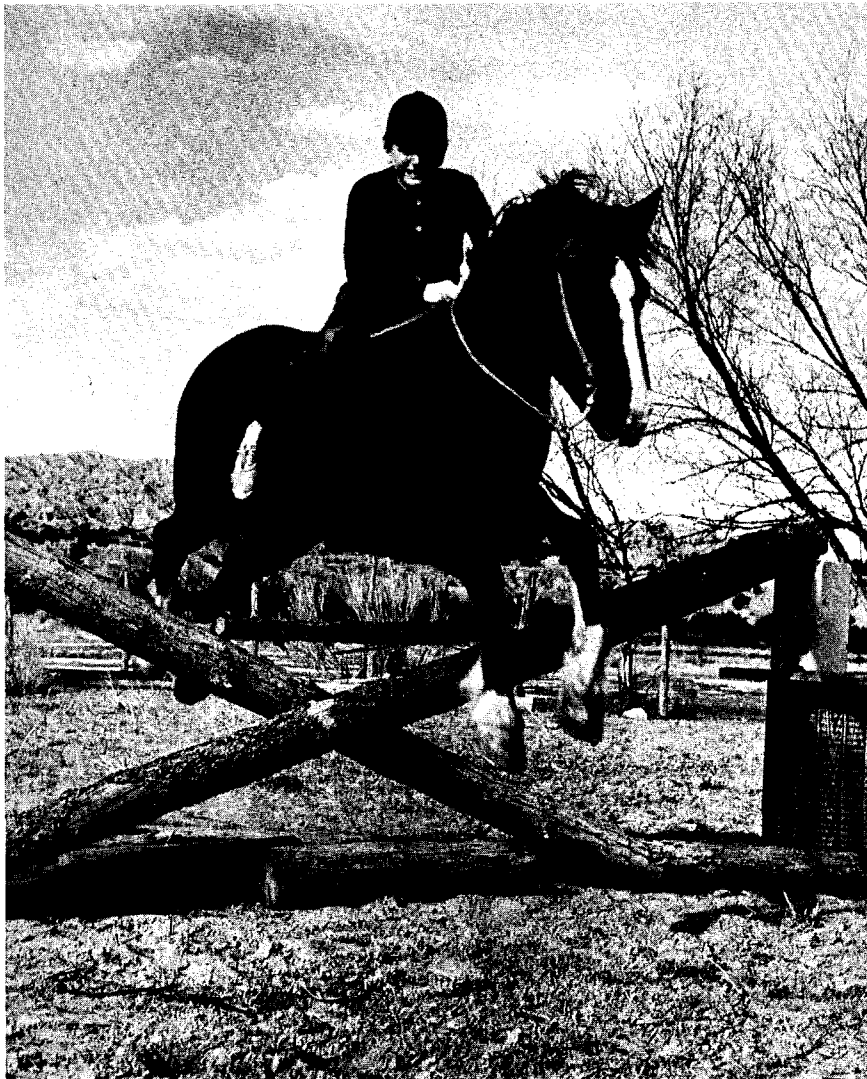
squeezing the deuterium gas with a pressure of 14 tons per square inch. The temperature of the gas shoots up to some 10 million degrees centigrade, in about three millionths of a second. The laser beam is directed into the end of the tube to shine through the gas as it is compressed by the magnetic field.

The hot plasma (compressed gas) shifts the paths of light taken by the laser beam shining through it, in turn changing the shadow pattern and producing what amounts to a contour map of the plasma density (concentric circles in lower photograph), similar to the contour

map of a mountain peak. The shadow rings represent, in effect, the stages or degrees of plasma compression from the outside in.

It is also necessary to be able to tell which is laser light and which is the light from the super-heated gas or plasma. The separation or discrimination is made possible by an interference filter and a pinhole lens—like using polarized sun glasses covered up except for a tiny hole. The combination of filter and pinhole cuts out the scattered and reflected light from the fireball, letting the highly directional light from the laser beam come through.





IT'S C HORSE

Especially Chronic It Becomes Epide

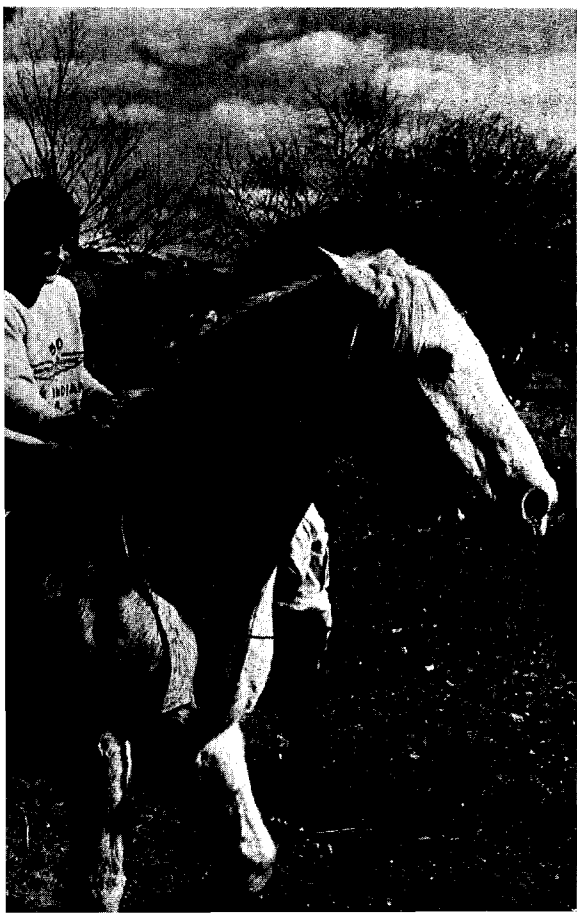
There is a virulent sort of contagious disease that is chronic in the country and especially in the Southwest, becoming epidemic in the spring. It is called horse fever. Young people are particularly susceptible; some never get over it.

The fever exhibits many different phases. During winter, when riding becomes impossible, the fever symptoms show up in looking at pictures of horses, talking about horses, arranging table-top gymkhanas in miniature, dreaming about horses, collecting ceramic figures of horses.

As soon as the weather breaks, horse shows pop up on the slightest provocation, such as the recent Pojoaque Valley Junior Horse Show sponsored by the Pojoaque Valley Junior Riders, held in Rody Capron's lower pasture while the snow was still on the ground.

Cow pasture horse shows are to Madison Square Garden as sandlot baseball is to Yankee Stadium. These events are lots of fun for participants and spectators alike, but they are also deadly serious. They follow the rules strictly, and often are professionally judged. They are also social events, the parents and friends outnumbering the horses, helping serve refreshments, patching up barked shins, taking pictures.

Thirteen of the fourteen participants in the Pojoaque event were



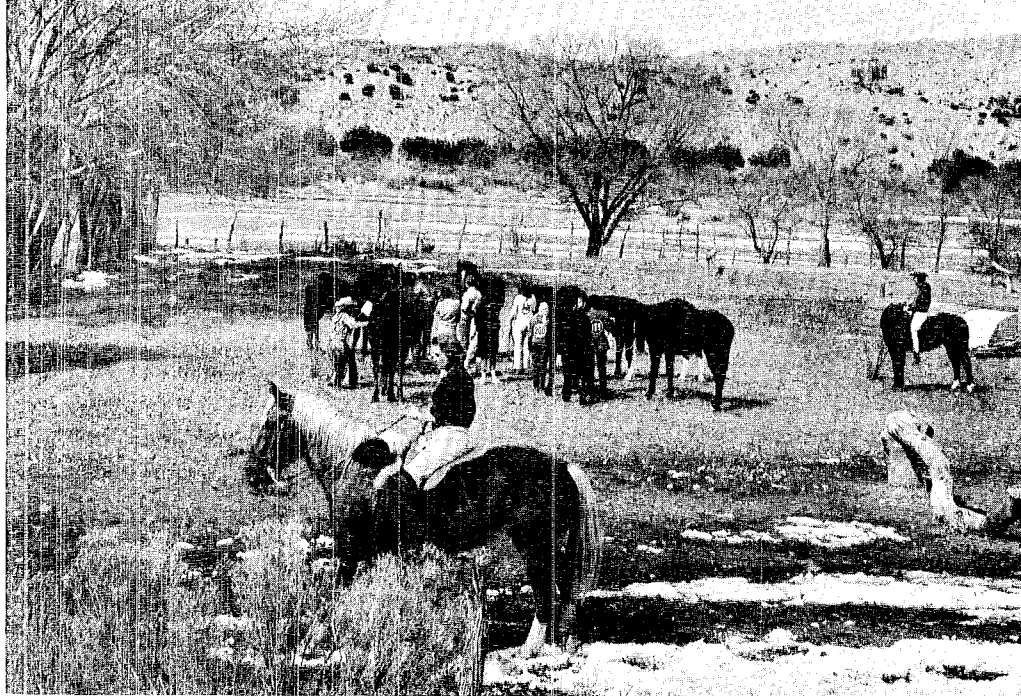
In her first competition, Jane Shreffler won the junior jumpers event riding Princess.

Eagle is 25 years old but still a lot of horse. Chris Capron rode him to win the bareback equitation class.

ALLED FEVER

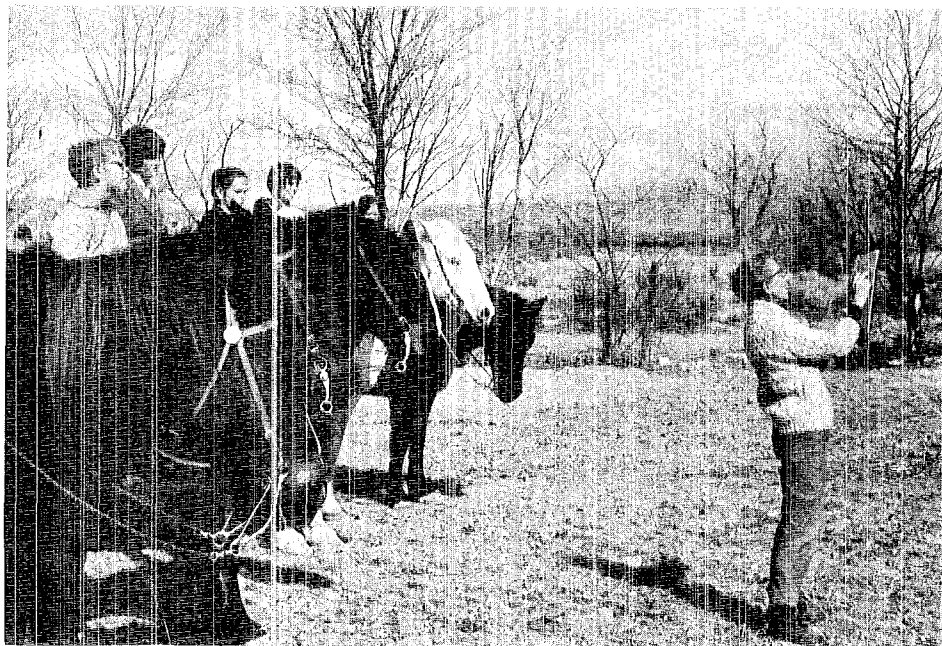
in the Southwest,
mic in the Spring

LAST children, all but one of them living in the valley, a great place for horses and kids. Competing in the six events were: Mary, Patsy, and Phyllis Osborne; Mark and Jean Ogle; Claudia and Leza Winnett; Chris and "R. G." Capron; Cynthia and Nancy Cole; Ruth Banta; Nina Houle and Jane Shreffler. Mrs. Joseph Droege of Santa Fe judged the events.



Getting ready for the show, the contestants cluster in the pasture to get preliminary instructions.

Phyllis Osborn has a little trouble getting her horse Topsy to cooperate in the halter class.



Mrs. Josephine Droege, Santa Fe judge for the junior show, shows the contestants how she wants them to perform.



WHAT'S DOING

FILM SOCIETY: Civic Auditorium. Films shown 7 and 9 p.m. unless otherwise noted. Admission by \$3 season ticket or 90 cents single admission.

Wednesday, April 15, "Murder at the Gallop." British mystery-comedy, 81 minutes.

Wednesday, April 29, "Ride the High Country." American western, 94 minutes.

LOS ALAMOS HIGH SCHOOL POOL: Schedule for public swimming. Adults, 35 cents; students, 15 cents.

Saturday, 1 to 6 p.m.

Sunday, 1 to 6 p.m.

Monday, 7 to 9 p.m.

Tuesday, 7 to 9 p.m.

Wednesday, 7 to 9 p.m.

LOS ALAMOS CONCERT ASSOCIATION: Civic Auditorium, 8:15 p.m. Admission by season ticket.

Tuesday, April 7, Jean Leon Destine and his Haitian Dance Company.

INTERNATIONAL FOLK DANCE CLUB: Open to the public. Meets the first Tuesday of each month, 8 p.m., Recreation Hall.

SWIMMING CLUB OF LOS ALAMOS, INC., Membership open to adults interested in swimming. Club meets every Sunday, 7 to 9 p.m.

OUTDOOR ASSOCIATION: No charge; open to the public. Contact leader for information on specific hikes.

Saturday and Sunday, April 4 and 5, Bandelier to Cañada via Stone Lions, Painted Cave and San Miguel, with an overnight camp in Capulin Canyon.

Leader, Bob Day.

Saturday, April 18, White Rock Canyon.

Leader, Roger Perkins

Sunday, April 26, Upper Crossing to Park Headquarters (Frijoles Canyon).

Leader, Betty Hansbury

Saturday, May 2, Rio Grande, downriver from Otowi Bridge.

Leader, Marlene Cockle

The Technical Side

Invited Papers for American Physical Society Meeting, Tucson, Arizona, February 27-29:

"Nuclear Properties at the Fission Saddle Point from (d, p) and (He³, He⁴) Experiments" by Richard H. Stokes, P-12.

"Experimental Study of the (He³, d) Stripping Reaction" by Allen G. Blair, P-12.

Talk at University of Wisconsin, Madison, March 6:

"Experiment on Plasma Acceleration and Trapping" by John Marshall, Jr., P-15.

Lectures at Austin College, Sherman, Texas, March 9 and 10:

"Satellite-Based Detection of Nuclear Explosions in Deep Space" by Richard F. Taschek, P-DO.

"Physics Research at the Los Alamos Scientific Laboratory and a Proposed Meson Facility" by Richard F. Taschek, P-DO.

Symposium on Nuclear Spectroscopy with Direct Reactions, sponsored by Argonne National Laboratory, Chicago, Illinois, March 9-11:

"Theory of Intermediate Structure" by James E. Young, T-DOT.

"Complex Single-Nucleon Stripping and Pickup Reactions [a, t], (d, He³), etc.]" by Allen G. Blair, P-12. (Invited paper.)

Third Conference on Exploding Wires, Boston, Mass., March 10-12:

"Exploding Wire Detonators:

Sweeping-Image Photographs of the Exploding Bridge Wire Initiation of PETN" by James H. Blackburn and Robert J. Reithel, both of GMX-7.

Lecture at Lamar State College of Technology, Beaumont, Texas, March 11 and 12:

"Satellite-Based Detection of Nuclear Explosions in Deep Space" by Richard F. Taschek, P-DO.

Seminars, Texas A & M, College Station, March 11, and Rice University, Houston, March 12:

"Proton-Proton Scattering at the Interference Minimum and the Shape Parameter" by John E. Brolley, P-DOR.

American Physical Society Meeting, Philadelphia, Pa., March 23-26:

"Dose-Rate Effects in the Coloration of Alkali Halides at 80°K" by Frank E. Pretzel, CMB-3; James L. Anderson and George N. Krebs, Jr, both summer students with CMB-3.

Classified Conference on High Temperature Materials Research in support of Non-graphite Cermet Systems for Space Nuclear Propulsion, Argonne National Laboratory, March 25:

"Fabrication of W-UO₂ by Powder Rolling and by High Deformation-Rate Extrusion" by Thomas J. Ready, CMF-13.

NEW HIRES

Thelma B. Black, Los Alamos, W-7 (Casual).

William James Baughman, Colorado Springs, CMB-1.

Linda Ann Stevenson, Grove City, Pennsylvania, T-6.

Alton J. Gray, Española, N.M., SP-3.

Richard William Johnson, Wichita, Kansas, K-4.

James Daniel Doss, Owensboro, Kentucky, P-11.

Thelma A. Carpenter, Los Alamos, H-DO (Casual-Rehire).

Richard R. Bernecker, Allentown, Pennsylvania, GMX-2.

Velta May Hampton, Los Alamos, W-7.

Loretta M. Baldrige, Los Alamos, W-7 (Rehire).

John Gee Park, Los Alamos, PER-4.

Viviana C. Griego, Santa Fe, N.M., WSD (Casual-Rehire).

Following are LASL new hires:

Sharon M. Paulsen, Glendale, California, SP-LA.

Hugh Roberts Lehman, Leavenworth, Kansas, W-8.

Yvonne V. Johnson, Los Alamos, N-DO (Casual-Rehire).

Hugh K. Cherry, Carlsbad, N.M., SD-1.

Arthur G. Saponara, Madison, Wisconsin, H-4.

Josefita Isabel Gonzales, Los Alamos, H-2 (Casual).



It looks like April will be a crazy mixed up month, judging by this LASL calendar in Wing 9 of CMR Building. Pondering the jumbled dates in the misplaced month are Ken Thomas and Swede Ekberg, CMB-14, and Leo Waldschmidt of K-2. After discovering this one, they turned up two more

calendars just like it—all in Wing 9. No it's not someone's idea of an April Fool prank. More likely, it is an almost fantastic printing error which was corrected before many of the Laboratory's calendars had been run off. The photograph was taken by Bill Regan.

Henry T. Motz
3187 Woodland
Los Alamos, New Mexico

